

CLAIMS:

1. A power supply (20) for a LED light source (10), said power supply (20) comprising:
 - a power converter (23) operable to provide a regulated power including a LED current and a LED voltage; and
 - a LED control switch (24) operable to control a flow of the LED current through the LED light source (10),
 - wherein said LED control switch (24) is further operable to clamp a peak of the LED current during an initial loading stage of the LED light source (10).
2. The power supply (20) of claim 1, wherein said LED control switch (24) includes:
 - a switch (SW1) operable to establish a current path from the LED light source (10) to said power converter (23) when the LED current is below a peak threshold, said switch (SW1) further operable to eradicate the current path when the LED current is above the peak threshold.
3. The power supply (20) of claim 2, further comprising:
 - a LED PWM dimmer (29) operable to provide a pulse width modulation signal to said switch (SW1) in response to an external dim command,
 - wherein said pulse width modulation signal has a target pulse width in response to the dim command exceeding a ramp signal, and
 - wherein said pulse width modulation signal has a minimum pulse width in response to the ramp signal exceeding the dim command.
4. The power supply (20) of claim 3, wherein said LED PWM dimmer (29) includes:
 - an astable multivibrator circuit (129) operable to establish the minimum pulse width in a precise and temperature insensitive manner.

5. The power supply (20) of claim 2, wherein said LED PWM dimmer (29) includes:
 - a comparator (U3) operable to establish the target pulse width in response to a reception of the dim command and the ramp signal.
6. The power supply (20) of claim 5, wherein said LED PWM dimmer (29) further includes:
 - a ramp generator operable to provide the ramp signal to said comparator (U3) indicative of the minimum pulse width.
7. The power supply (20) of claim 6, wherein said LED PWM dimmer (29) further includes:
 - an astable multivibrator circuit (129) operable to establish the minimum pulse width in a precise and temperature insensitive manner.
8. The power supply (20) of claim 1, further comprising:
 - a detection circuit (30) operable to provide a detection signal indicative of an operating condition of the LED light source (10) associated with the LED voltage,
 - wherein the detection signal has a first level representative of a load condition of the LED light source (10), and
 - wherein the detection signal has a second level representative of either a short condition or an open condition of the LED light source (10).
9. The power supply (20) of claim 8, wherein the load operating condition indicates a magnitude of a LED voltage drop across the LED light source (10) is between zero volts and the LED voltage.

10. The power supply (20) of claim 8, wherein the short operating condition indicates a magnitude of a LED voltage drop across the LED light source (10) approximates zero volts.

11. The power supply (20) of claim 8, wherein the open operating condition indicates a magnitude of a LED voltage drop across the LED light source (10) approximates the LED voltage.

12. The power supply (20) of claim 1, further comprising:
a current sensor (25) operable to sense the LED current flowing through the LED light source (10), said current sensor (25) including
an operational amplifier (U6), and
means for adjusting a gain of said differential amplifier.

13. The power supply (20) of claim 1, further comprising:
a voltage sensor (26) operable to sense the LED voltage applied to the LED light source (10), said voltage sensor (26) including
an operational amplifier (U6), and
means for adjusting a gain of said differential amplifier.

14. A method of operating a LED light source (10), said method comprising:
providing a regulated power to the LED light source (10), the regulated power including a LED current and a LED voltage;
controlling a flow of the LED current through the LED light source (10); and
clamping a peak of the LED current during an initial loading stage of the LED light source (10).

15. The method of claim 14, further comprising:
generating a detection signal indicative of an operating condition of the LED light source (10) associated with the LED voltage,
wherein the detection signal has a first level representative of a normal operating condition of the LED light source (10), and
wherein the detection signal has a second level representative of either a short operating condition or an open operating condition of the LED light source (10).